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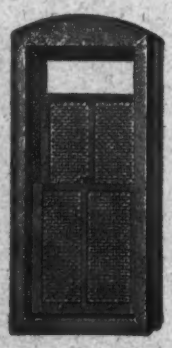

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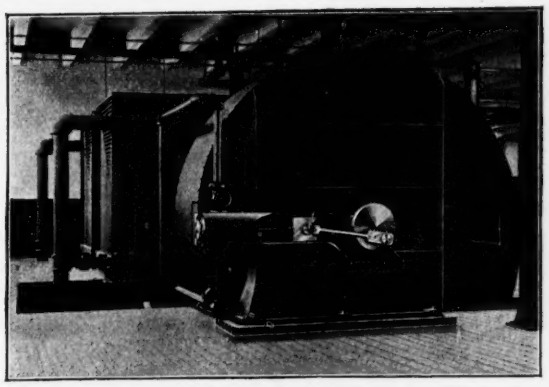

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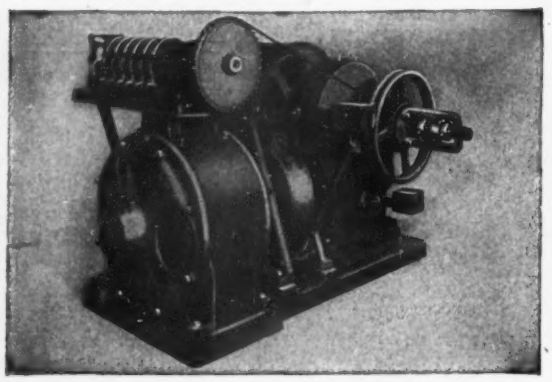

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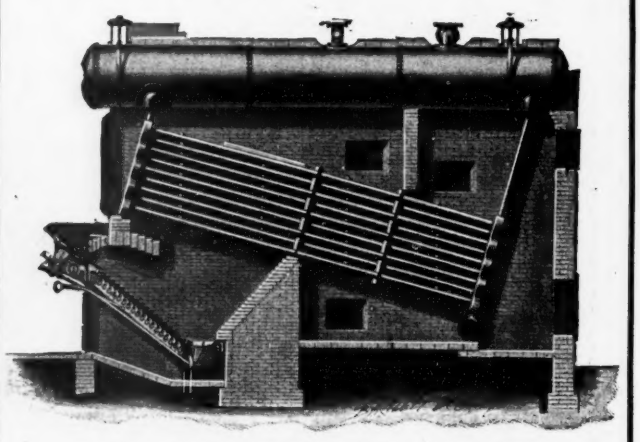

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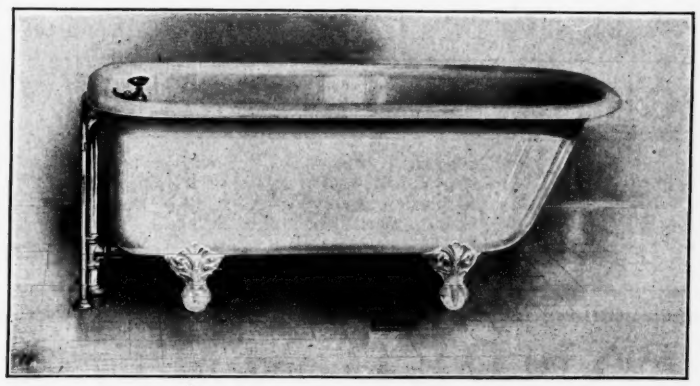

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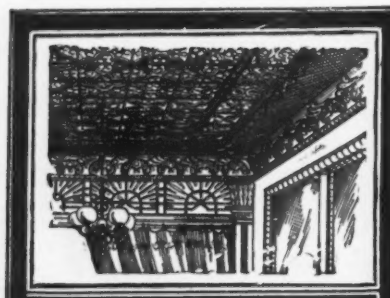

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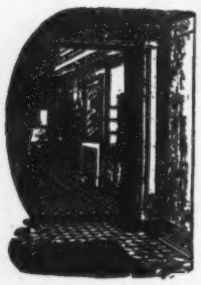

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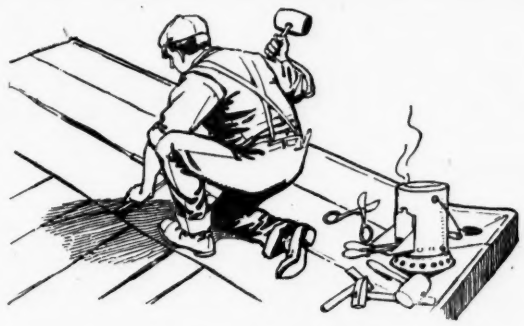

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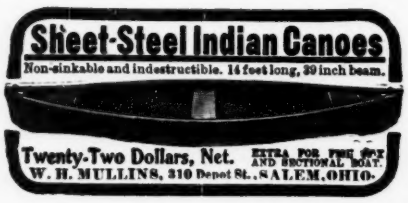

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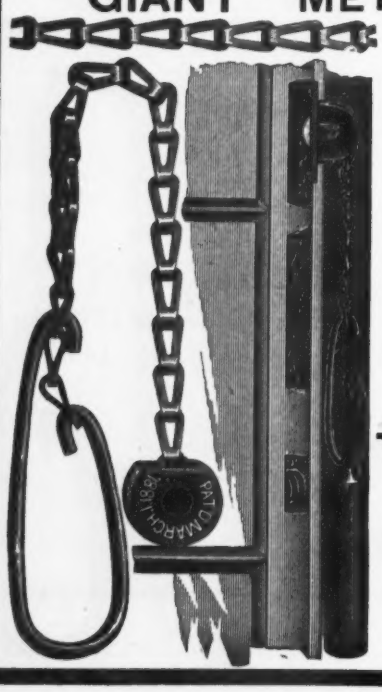

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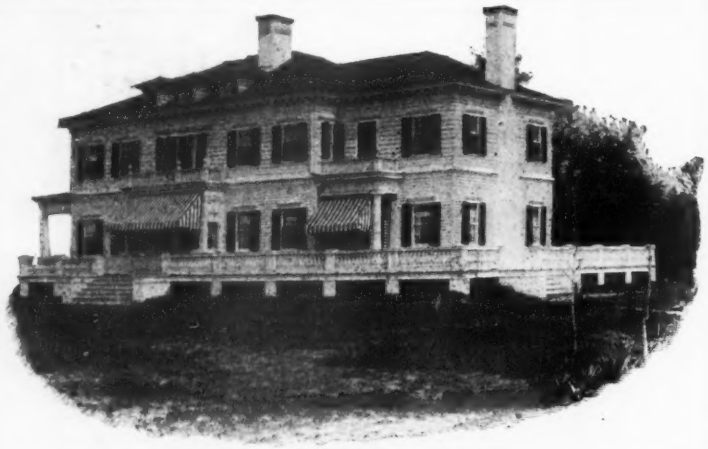

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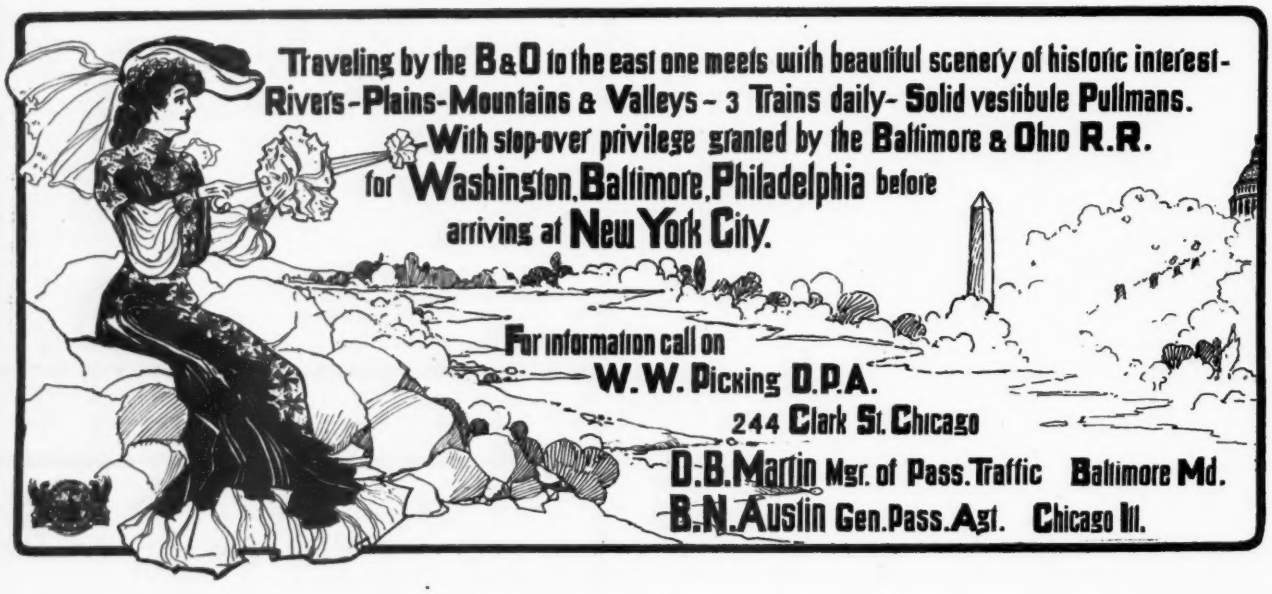
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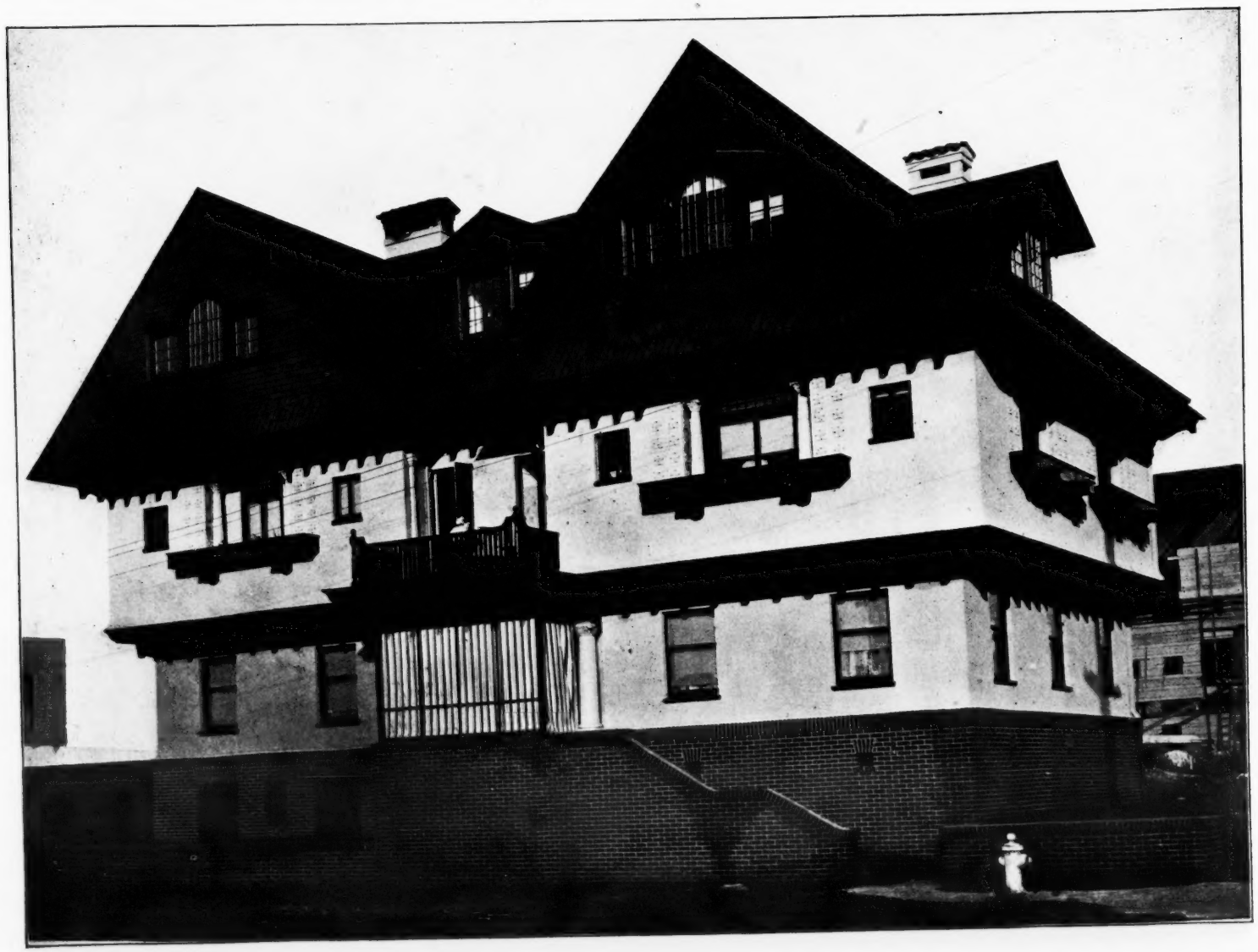

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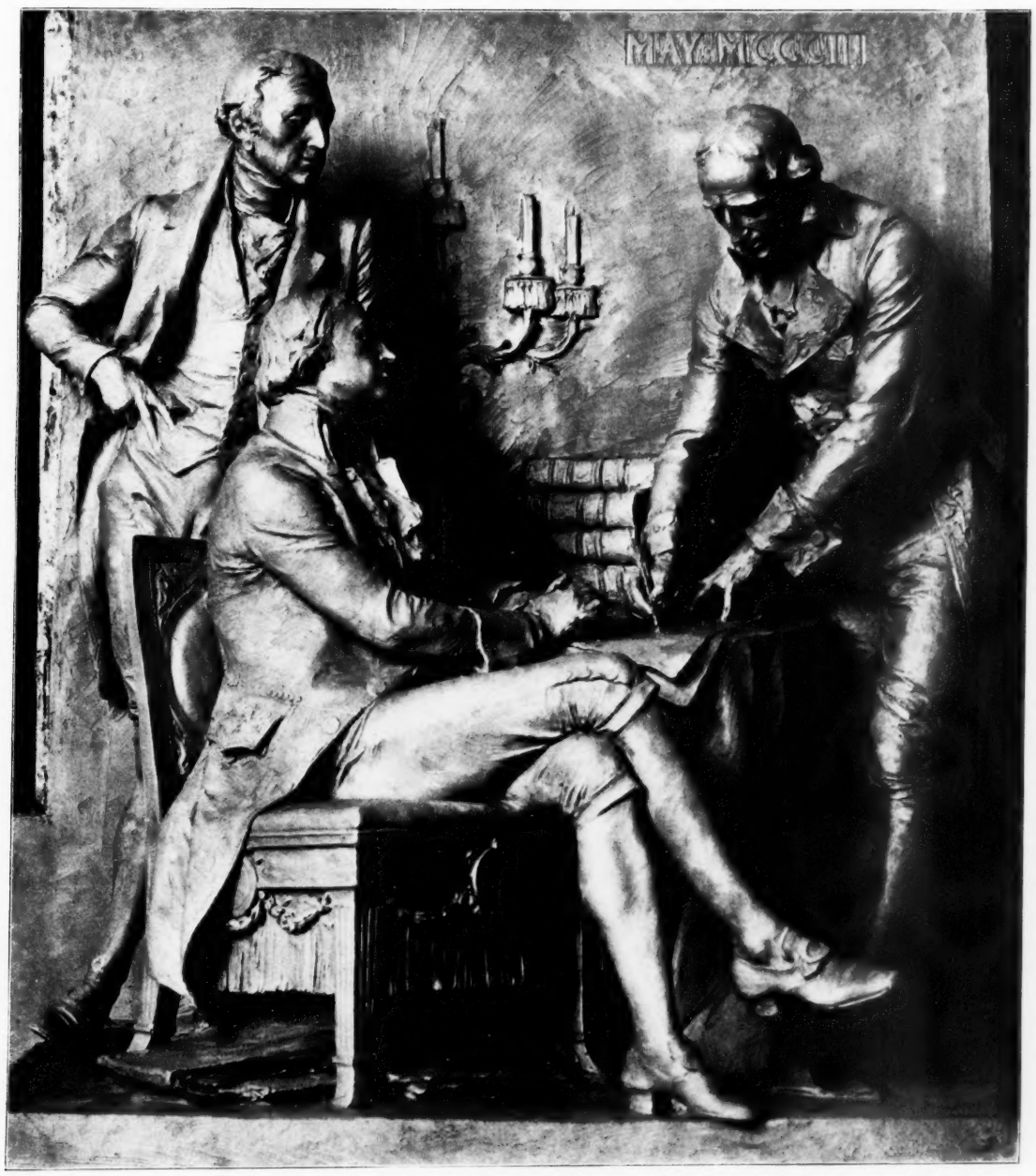

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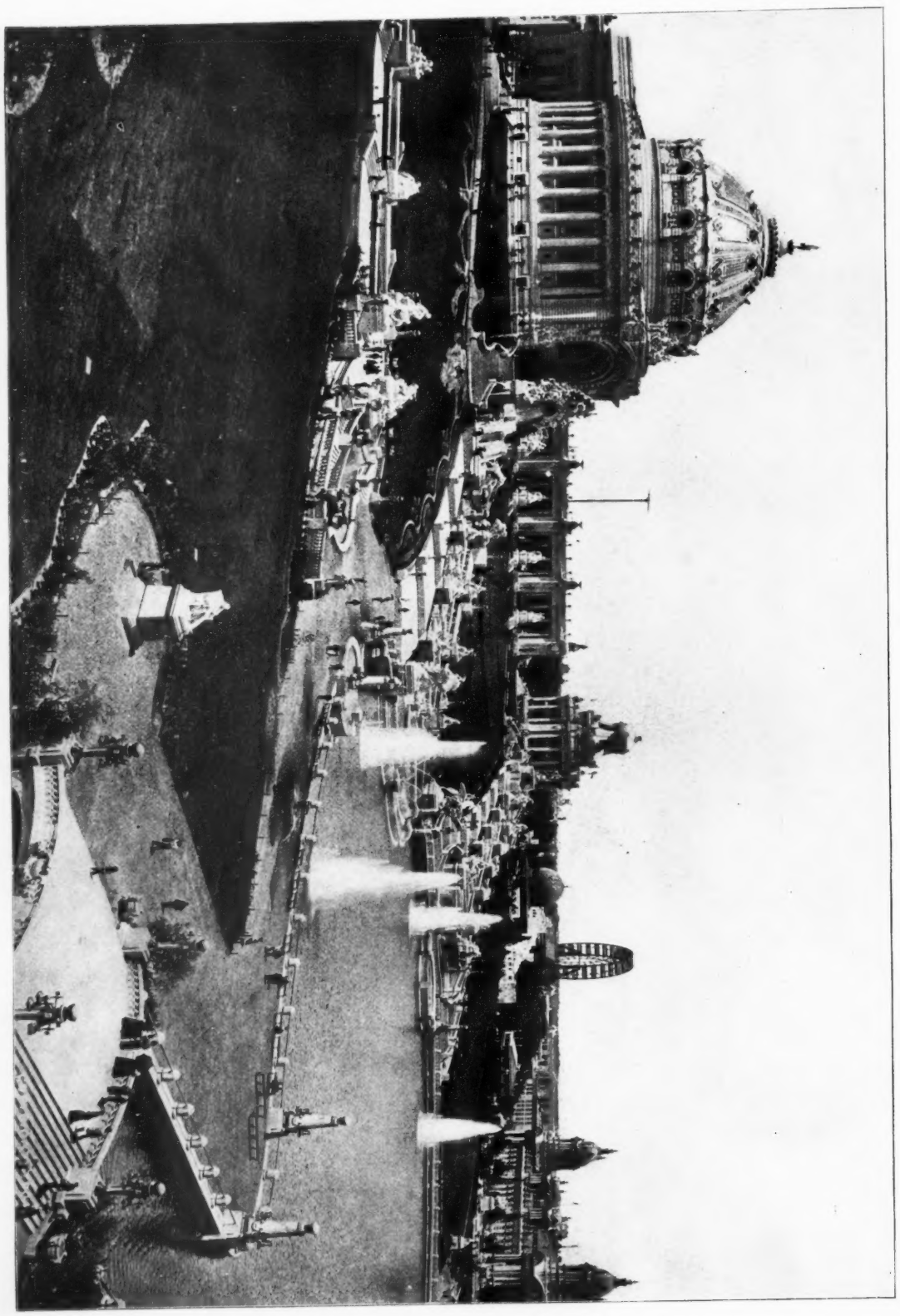

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Death of John Moser, Architect.

The announcement of the death of John Moser, architect, of Washington, will, by the older members of the Institute, bring a remembrance of one of the most peculiar personalities that has been known among the members of the profession. Never reaching the prominence of a designer of great buildings and a large private practice, there have been few who were better educated in its art or more devoted to its traditions than he. A man of college training, with a strong bent for architecture and music, he made a profession of the former and became one of the most scholarly and widely esteemed of American architects in the early days of the American Institute. From the Institute he received the first prize at a meeting in Boston in 1883 for the best design submitted for a home building appropriate for the uses of that body. The competition circular having been given out the previous year, Mr. Moser, then living in the little town of Anniston, Alabama, worked out upon a large scale a modern commercial building, whose façade, while symmetrical and harmonious, should embody the whole history and evolution of architecture, from the rough, unhewn stone to the most elaborate Victorian Gothic of the latter part of the nineteenth century. Nothing beyond the arrangement was invented, each architectural order being shown by some representative and well-known classic example. This drawing established Mr. Moser's reputation, both at home and abroad, and made him the American corresponding member of numerous French, German and English architectural societies. This brought him also the personal admiration of the members of the American Institute of Architects, to whom his high ideals and enthusiasm for architecture as an art appealed with peculiar force. He resided for some time in Washington as chief designer under the Supervising Architect, the late M. E. Bell. While the Cotton Exchange in Galveston, Texas, and some other important American buildings stand to his credit as a practicing architect, he was always a student and more devoted to the art and theoretical side of architecture. James Henry Moser, the Washington artist, is the eldest and only surviving son of John Moser. Mrs. Siegmund Ivanowsky, wife of the illustrator, is an adopted daughter of the architect. Mr. Moser, who was seventy-two years old at the time of his death, was born at Mannheim, near Heidelberg, Germany, and came to America in 1848. He died September 3, at Atlanta, Georgia, at the residence of his daughter, Mrs. H. E. Corbett.

The Invention of Steel Skeleton Construction up Again.

The credit for the "invention" of the skeleton steel building is once more brought before the public, and it is hoped for the last time. When, about ten years ago, suits were threatened against the owners of the large steel structures first built in Chicago, by an architect of Minneapolis who claimed the system as an invention, little notice was taken of the matter, except articles in the public press giving the views of architects upon the subject, but while it was established that certain architects constructed certain buildings upon certain lines at certain dates, none but the Minneapolis man claimed to have "invented" skeleton steel construction. While these buildings, made possible or practical by the elevator, were first constructed in Chicago, the scheme of constructing walls by filling panels with some clay product was "old as the hills." Mr. Pond, in his letters from Spain printed in this journal in 1885, described buildings so constructed by the Moors. About that date a building was designed for the Walker estate by John W. Root, but never built, in which he described the walls as constructed of "a steel frame filled in with panels of terra cotta." The wall behind the elevators of the Phoenix building, by the same architect, was so constructed, and then came the Home Insurance building — skeleton steel in a modified form — and the Tacoma, a steel skeleton structure. And so this form of construction grew. But it was never invented by any one in a legal sense. The syndicate that is making this last effort to collect royalty from owners has probably become active because the alleged patent expires next year, but owners have little to fear from any claims it may set up for royalty upon the mode of construction, except, perhaps, its defense in the courts, as even if Mr. Buffington's claim of priority of design were valid, the description of ancient structures of this kind by Mr. Pond and other architectural writers would invalidate such contention.

SOME BRETON CHAPELS.

ABOUT ten miles north of Quimperlé, on the departmental road running between that town and Carhaix, says F. C. Eden in *The Builder*, there is a spot where the traveler who keeps a sharp lookout toward the east may be able to detect a group of three slender spirelets just showing their points above the trees. A gate in the hedge opens into some squalid farm premises, across which a dirty track, almost impassable in wet weather, must be followed, till it loses itself in a green field, where there rises out of the grass just opposite the charming gothic front of S. Fiacre's Chapel. Here we have a typical building of its class, and a veritable treasure-house for painter, architect, or ecclesiologist. Typical in many respects, for to the fact of its being not a parish church, but a simple chapel, where the only services held during the year are at the annual "Pardon," or dedication feast, it owes an entire immunity from restoration.*

S. SEBASTIAN.

Even in remotest Brittany it is hard to find an unrestored church, so that it is to the chapels that the true lover of "old, unhappy, far-off things"—of things Gothic, in fact, must needs turn. Typical, too, is S. Fiacre in the way it eludes discovery—even when you know the whereabouts of one of these buildings it is often extraordinarily hard to come upon, and usually impossible of access except on foot—and so, also, in its evidences of former prosperity, and of having been designed in a fine enthusiasm, and with far greater originality and skill than the average parish church of the district, where too often dulness reigns. There is one almost invariable accompaniment of a chapel which, however, S. Fiacre lacks, and that is the grove of closely planted beech or chestnut trees which made thin shadows about the Calvary, and on the mossy turf, and seem to suggest, as things in Brittany so often do, some Druidic prototype.

To return to the façade. The *clocher* is a remarkably good example of a fairly common type (*cf.* Penmarch and Tronoan, where it stands over the chancel arch, and the ruined church at Kérity). The west wall is of enormous thickness, and carries three spire-crowned turrets. The central spire is crocketted, and springs between traceried gablets from the square open stage in which the bells are hung. At the foot of this stage (which is sturdier than usual) is an overhanging gallery, prettily corbelled forward, and bridged across right and left to lesser flanking turrets, one of which encloses a newel stair, and the other a little octagonal room with square-headed windows. The side spires are of unequal height, and the southern, or stair turret, is set somewhat behind the plane of the other two—a delicate subtlety of design, in no way dictated by structural necessity, but completely justified by results, in that the three spires, as seen from different points of view, group in curiously puzzling and picturesque perspective. The material is a close-grained variety of granite, capable of receiving exceptional delicacy of treatment, and the detail is all of the most refined character.

The south porch is of the "Apostle" type, so common throughout Brittany, with double entrance doors, and a canopied stoup corbelled out from the *trumeau*. The interior exhibits many characteristic features. Here you may expect to find a floor, partly of heavy granite slabs, and partly of earth; a painted rood screen, with its loft and figures; moldy altars defaced and disused; tattered shreds of rich glazing festooned across traceries of extreme elegance; a large east window, with a central mullion in a square, English-looking *chevet;* whitewashed walls sensibly striped along the base with black; many homely images on brackets about the altars, those of Our Lady and the patron on the east wall enshrined in rich shuttered tabernacles of timber; a boarded barrel ceiling, distempered blue, but with its wall-plates and dragon-headed beams uncolored; and perhaps a wheel of bells or a decayed altar canopy lying somewhere in a corner.

Such, surely, must have been the appearance of many of our own village churches in Elizabeth's reign. Here we have the very items of the sixteenth century inventories, with that old-world savor clinging about them yet, which the quaint directness and antique spelling of the inventories themselves seem so curiously to reflect. How better could one describe the rood screen at S. Fiacre, for instance, than as "a parclose of old paynted tymber devyding the quyer and the body of the church, whereon stondyth a roode with dyvers olde ymages of tymber"?†

The altar in the middle of the aisle, now covered with broken imagery, shows signs of having been "inclosyd with oke." What the early ecclesiologists called a "bench-table" runs along the north wall and round the transepts, and is the only "sitting accommodation" in the chapel. There are many fragments of glass. The most complete window is that over the altar in the south transept. The center light displays a jesse-tree on a blue ground, and the sidelights the twelve apostles in couples under canopies. In the choir there is "j lytell galery of tymber" capable of holding about three persons, and approached by a stone turret stair. Whether it was a pulpit or a singer's gallery could not be determined. It is now rickety and unsafe.

The screen was badly tinkered some time in the sixties, when its stair was probably made away with. There is no evidence to show whether it was straight as at S. Nicolas, or spiral, as at Lambader; and now there is no means of access to the loft.

The little market town of Le Faouët, situated on a hill about two miles to the north, will be found an agreeable stopping place—at least it used to be so before it was "discovered" by artists. From here may be visited two other chapels of great interest—namely, S. Barbe and S. Nicolas.

A pleasant walk of about a mile along a paved pilgrim's way through field and forest brings us to the brink of a deep wooded combe, at the bottom of which sparkles the Ellé. Here the chapel of S. Barbe comes suddenly into view over the precipitous edge of the valley, growing naturally enough from a kind of rocky ledge among trees and boulders. The first glimpse is disappointing, for the heavy hand of the nineteenth century has been laid sore upon the little sanctuary, knocking the medieval fun out of it, and leaving all sleek and prudish.

We are standing on a paved platform, from which a noble granite stair branches downward to right and left; in front a bridge carries the gangway across to the tiny chapel of S. Bernard, perched on an isolated rock, but, save for its position, uninteresting. The stair to the left lands us just in front of the entrance to S. Barbe. The building, small as it is, is provided with two large double doorways, side by side, each pair under an enclosing arch, doubtless arranged for the stream of pilgrims to file past in an orderly way on the occasion of the "Pardon," which is said to be much frequented.

The plan is curious, and consists merely of a quasi-transept, from which a shallow apse juts over the steep valley side. The exterior of this part of the building has an air of dignity and repose out of all proportion to its size. The northwest angle turret is probably designed to represent the traditional emblem of S. Barbara, namely, the tower in which she was imprisoned by her father, and one may see the image of the saint peering from an unglazed upper window. Here is some fair late glass, much mixed with bad modern stuff, and a carved gallery, but the chapel has been considerably modernized, and, compared with the outside, the interior presents few features of interest.

DES CIEUX, NEAR HUELGOAT.

The Chapel of S. Nicolas, in Prisiac, is most difficult to find. It is too far from Le Faouët for a guide to be taken, and as the peasants speak no French, it is little use for one unacquainted with Breton to ask the way. It stands on high ground, about half a mile from the road, and is completely hidden by trees. The belfry is simple and good, but otherwise the outside is not particularly attractive. The great feature of the chapel, however, is its magnificent late screen. The whole is painted, and both sides of the loft bear figure sculpture; the west, scenes from the life of the patron, and the east, the twelve apostles; on this side there is a fixed desk in the form of a pelican. An unusual feature is the paneled and canopied backboard to the road, which stands in the usual Breton way, not in the loft, but on the gallery front. The screen was repainted, as an inscription testifies, in the year 1768, but all the same the coloring is excellent, if somewhat rough in execution, and doubtless follows the old lines. The plan of the chapel is cruciform, without aisles, and, as at S. Fiacre, the screen stands west of the crossing.

The nave is very dark; in fact there is only one window, and

* An immunity it is not likely to enjoy much longer, for the building has been made a *monument historique;* so that if any one would see it before it is reroofed, refloored, replastered, receiled and reglazed, let him set about doing so without delay.

† From the inventory of Temple Balsale.

that a small rose set high up in one of the side walls. It is not unusual for the smaller chapels to be thus scantily provided with windows. One near Le Saint has only two, both being in the chancel, and in a cornfield near Belle-isle-en-Terre is a chapel, capable of holding some fifty worshipers, which has no windows at all. At the "Pardon" (as the writer had the opportunity of observing) the bulk of the assistance is "accommodated" outside.

S. Nicolas has some interest for Englishmen, in that an effigy of Dutch William, called Pistolance (Prince d'Orange), was for more than a century solemnly burnt at the annual "Pardon"; an edifying ceremony now fallen into desuetude. Probably the best-known and the most ambitious edifice of its class is the chapel of N. D. de Folgoët, near the remote town of Lesneven, in the northwest corner of Finistère. Its very richness in carving and moldings has been its undoing. Its Gothic spirit is now quite broken, for the whole building has been so scarified within and without that the frigid inhuman interest of the typical *monument historique* is all that remains. There is a good stone *jubé*, remarkably effective on the east or wrong side, and a high altar, fourteen feet long, adorned along the front with a row of niched figures.*

Lambader is easily reached on a bicycle from the old cathedral town of S. Pol de Léon. It is a former chapel of the Templars, and in plan and scale much resembles a parish church. Two fine crosses are passed on the approach, and there is a broken shaft and a Gothic fountain in the churchyard. The fabric has been utterly modernized, but still retains sundry features of interest. There are three medieval altars, each with its stone "halpas," or low reredos, provided with a broad top for the display of images or reliquaries, and not to be confounded with the modern "gradine." The halpas is itself a reredos, the top of which forms a shelf or ledge; not a shelf for candlesticks set in front of a reredos.

The screen is delicate and elaborate rather than beautiful, and is chiefly noticeable for the excellent contrivance of its spiral stair. So cunningly is this managed that, though standing between screen and altar, it interferes in no way with the view of the latter as seen between the muntins. Nor is it a flimsy affair by any means. The steps, eighteen in number, are solid, of about 6½-inch rise, and tenoned into a 4¾-inch newel post. Each is pinned to the step above it, and, though no support is given by the outer string, which is purely decorative, the stair is as firm and noiseless as when first put together.

The chapel known as the Creisker, at S. Pol, has likewise been made a national monument, and with the usual result. It is of the general form and scale of a parish church, and has an ugly steeple, which is much admired.

Belle-isle-en-Terre, a small town on the main road, between Morlaix and Guingamp, though, like Le Faouët, it possesses no buildings of any interest, is a convenient stopping place, and has a comfortable inn. About seven miles to the west, in the direction of Morlaix, and right upon the high road, lies the chapel of Keramanach ("house of the monks"). This little edifice exemplifies what has been said of the extreme care which was often bestowed upon the design of these buildings. The simple belfry is entirely satisfactory in proportion and detail, while the windows show what time and skill can do with such a stubborn material as granite. The tracery is both strong and refined; that of the great east window comprises over ninety openings, and, unlike so much flamboyant work, is divided into orders duly subordinated; indeed, considering the nature of the material, the grace and freedom of its lines are quite wonderful.

The plan is a simple parallelogram, with a porch and north aisle, the latter apparently added as an afterthought. Behind the altar is a low wall inclosing a small sacristy, which is entered by a minute door on the gospel side. The middle part of the wall is stepped up to make space for a reredos composed of alabaster reliefs set in a black wooden frame. The only remains of the screen are two molded uprights, and a short piece of cross-beam set gallows-wise against the south wall as a support for the rood. A canopy, or tester, which was formerly suspended by a chain over the high altar, of gothic form, but debased detail, now lies neglected by the west door. The tracery of the east window is full of delicate fifteenth-century glass, consisting mostly of heraldic devices and angels in white and stain.

In a valley that intersects the curious boulder-strewn country about Huelgoat lies the beautiful chapel of S. Herbot. Seen from far is the great square tower, which gives such nobility to the little sanctuary as the smaller Breton churches can seldom boast. In the churchyard is a Calvary group poised on a tall shaft. It is a good specimen of its kind, and more satisfactory than the wild processions of crude imagery which attract so many tourists to the ambitious structures at Guimiliau and Plougastel. The screen is fully developed Renaissance, and has no loft. On either side of the rood, in painful contortions, are the gibeted figures of the two thieves. Several old painted saints stare out of tabernacles beside the altars, or stand on iron brackets against the columns. The building is in good repair, and looks as if it were used for parochial purposes, but, happily, it has not yet been "brought up to date."

Kerfons Chapel is in a very remote situation, far from the high road, and, perhaps, for this reason, retains more of its ancient fittings than any chapel which the writer has visited. It has, however, suffered terribly from neglect and ill usage. Part of the nave has evidently been open to the weather for some considerable time — it is now rudely ceiled with deal boards, and the condition of much of the woodwork is sufficiently deplorable to be made the excuse for a good deal of doubtless drastic renovation whenever it is taken in hand.

The screen, with its loft and spiral wooden stair, is of exceeding richness. The painting lacks the delicacy and precision of English work, but is soft and pleasant in tone. Images of SS. Mary and John, much weathered and withered, still adorn the gallery front, but the rood itself lies in pieces in the loft. It is a simple cross *ragulé*, but when reconstructed was found to be of such admirable proportions, and to compare so well with the side figures, that the dimensions are worth noting. They are as follows:

Height of cross, 7 feet 8 inches. (The top has been fitted to a socket, possibly for the pelican in her piety.) To underside of arms, 5 feet 10 inches. Width across arms, 5 feet 7 inches. Diameter of section, which is roughly circular, 3½ to 4 inches. Height of the Christ, 4 feet 11 inches; of side figures, 3 feet 4 inches. Distance apart of same, center to center, 5 feet 6 inches. Height of loft front on which all stand, 3 feet 9 inches.

S. FIACRE: WEST FRONT.

Beside the broken rood there was a "stondyng letterne of tre in the rode lofte," a triangular pedestal covered with flamboyant carving and supporting a double turning desk, the feet in the shape of clenched hands. There is some good paneling in the transept with a fixed bench against it; several linen paneled doors with braced stiles; quite a "populus statuorum," forlorn things on brackets; an interesting and peculiar Renaissance ceiling in the south transept, and some good furniture in the sacristy falling to decay.

Of the other chapels visited by the writer, Kernascléden, a rich, vaulted building, is a *monument historique*, and has been vulgarized *à la mode*. It is now parochial. There are some paintings of angels in fine floating draperies on the north transept vault, and an elaborate porch. N. D. des Cieux, near Huelgoat, has a picturesque belfry, but the inside is spoiled.

Locmaria, finely situated on the lofty river bank just above Belle-isle, has a beautiful screen, which has lost one, and that the more elaborate side of its loft, by its unfortunate conversion into a western gallery. Judging from the beauty of what remains

*Nodier gives a fine measured drawing of this altar.

it must have been quite as fine as the Kerfons example. The good painted rood figures were found stowed away in a little ossuary adjoining the porch.

The following particulars of the medieval altars in S. Fiacre and elsewhere will be of interest to ecclesiologists. They are all of granite, and, with very few exceptions, perfectly plain. The *mensa* is a thickish slab, chamfered on the under side, and there is usually a simple hollow for a base-mold just above the floor level. It seems unlikely that the lesser altars had foot-paces, but if so they were doubtless of wood, and movable.

It may be noted that, as in England, the altars, when not set against screens or pillars in the body of the church, stand under windows, the glass-line of which is seldom more than two or three feet above the *mensa;* the window itself, in conjunction with the inevitable pair of images on brackets, doing duty for a reredos. The dimensions of the high altar at S. Fiacre are 11 feet 7 inches by 4 feet 1 inch by 3 feet 3 inches high. The fore part of the *mensa* is carried on columns, the back part resting on a block of masonry. The sill-line of the east window is 2 feet above the top of the altar, and the total width of the chancel is 21 feet 8 inches; less than twice the length of the altar, be it noted, in view of the undignified stumpiness of most modern altars. I measured an unusually large altar in the parish church of Plouaret. The slab is 18 feet long by 3 feet 10 inches in width, and is 10 inches thick; here the altar is even larger in proportion to the width of the chancel, which is only 26 feet 6 inches between walls.

S. Sebastian's altar stands outside the screen, against the eastern pier of the nave arcade, and has a stone reredos 4 feet 8 inches high, resting on the altar itself, not, as is the usual modern arrangement, on a separate erection. The dimensions are 5 feet 7 inches by 3 feet 3 inches by 3 feet 7½ inches high. Altars in the body of the church, against columns and so forth, are of course relatively short.

The screen altar is 5 feet 2 inches by 3 feet 9 inches by 3 feet 6 inches high; and has a rough ledge at the back raised an inch or two above the slab, which probably carried a halpas or low reredos.

The north end of the aisle altar is built right up to the wall, interrupting the bench table, and there is a bracket piscina projecting at the back. The slab is 6 feet 4 inches by 2 feet 6½ inches wide, including a space 7 inches wide on which a reredos formerly stood. The height is 3 feet 1¼ inches above the present floor level.

At Lambader a Gothic altar in the nave measures 5 feet 10 inches by 3 feet 10½ inches by 3 feet 4½ inches high, and carries a halpas about 2 feet in height. The altar in the north chapel is 5 feet 3¼ inches by 3 feet ½ inch by 3 feet 4 inches high. Its halpas is 2 feet 2½ inches high, and 10¾ inches broad, and carries two plain shields in front, and a molded cornice. From the top of the halpas it is 1 foot 8 inches to the glass line of the window.

The north transept altar in S. Nicolas measures 6 feet 2 inches by 2 feet 6 inches by 2 feet 11 inches high, and is 1 foot 5 inches below the splay of the window sill. The high altar at Keramanach is 11 feet 1 inch by 2 feet 10½ inches by 3 feet 8 inches high, in a sanctuary 21 feet wide, so that the proportion is about the same as at S. Fiacre. One point to be noted in connection with old altars is their ample width from front to back; a dimension almost as essential to dignity as length, but the importance of which is rather apt to be overlooked nowadays.

The few chapels described above are those alone which the writer has had the opportunity of studying; but when it is stated that in the department of Morbihan there are no less than 118 (omitting those which are in ruins or quite modern), in the Côtes du Nord 98; and in Finistère 45, whose dates range from the twelfth to the eighteenth centuries; and that some of them, as Rosgrand, S. Avoye, Bréhan, N. D. de la Clarté at Baud, S. Nicolas at Plédran have rood screens, or considerable remains of such; that several still preserve mural or roof paintings; that still more retain reredoses, imagery in wood and stone, and considerable quantities of stained glass, and that there are more or less interesting crosses, calvaries or fountains in the vicinity of the majority, it will be seen what a field for discovery is open to any one who should be led to make a special study of these unique buildings.

THE PROPER RELATION BETWEEN HOUSES AND TREES.

WE are now at the season of the year when the planting of trees and shrubs is general, sometimes in replenishing or adding to gardens which have been in existence for some time. Unquestionably in England, says *The Builder*, more than in any other country, trees and shrubs as additions to houses are prized, but in too many cases the desire to have grounds beautified in this manner is carried out with singular want of thought.

In the planting of trees and shrubs in proximity to a house, the first requisite is the use of the imagination. The faults committed from a neglect of it can be seen in innumerable country gardens, and near hundreds of villas. For trees and shrubs are constantly planted by those who entirely forget their future growth. Nothing is indeed more easily overlooked, and so it comes to pass that grounds are laid out thinking only of the present. It is one of the commonest sights in the world to see a large coniferous forest tree cribbed and confined in the small space of a villa garden, when, after darkening windows as it grew larger, and being rendered hideous by the cutting of its limbs, it is finally cut down and made into firewood. Again, how often in country gardens do we see houses darkened and rendered damp by the proximity of some fine tree which the original planter has placed in an unsuitable position because he never tried to realize the respective proportions of tree and house in a distant future? And in the present time the occupier is torn asunder by his wish to preserve a beautiful natural object, and his wish not to have his house made dark and damp by an ample and misplaced shade. Imagination, then, the picturing in the mind of the young tree of to-day in its maturity, is absolutely necessary, if planting, especially within sight of a house, is to be properly executed. The example just given is, of course, an extreme case, but how constantly do we find views from windows blocked or spoiled by the intervention of trees and shrubs which, admirable enough in the days of their youth, become positive nuisances as they increase in size. The necessity of imagination and thought in planting trees and shrubs as external additions to a house can not, therefore, be too strongly insisted on, and it might be exemplified to any extent.

But position and distance being considered in reference to the future, a further consideration — and we are looking at this subject of planting chiefly in relation to the house, and not in regard to grounds, whether woods or shrubberies, which may be regarded as standing by themselves — is the nature of the trees and shrubs. This is an important point, and one too often neglected. The owner has a liking for this tree or that, and he forthwith has one planted, without regard to its peculiarities. But while one tree may be quite objectionable near a house, another may be almost harmless. Thus, a horse chestnut, with its immense mass of large and dense foliage, retaining a quantity of moisture, and capable of shading the brightest summer sun, may positively spoil a house, where a birch, fragile, small-leaved, and admitting between its drooping twigs both sun and air, may be planted much closer to a building than the chestnut or the oak. Again, though the elm has many attractions, it is a bad tree to plant near houses, or, indeed, in grounds at all. Its roots running along the surface of the ground render it very liable to be bodily overturned by autumn gales; and as it grows older its limbs, or even its upper trunk, are at any time liable to break off in the most treacherous manner. Then, again, if we do not look too far ahead, the slow growth of the walnut and the mulberry makes them suitable to be planted where there is a view which it is not desired wholly to prevent, though for some reason or other a tree is necessary within the field of vision. The importance, too, of the smaller growing trees is too often overlooked, such as the ilex, the sumach, the acacia, and the snowy maspilus; while the inconvenient habit of the lime, beautiful tree as it is, of shedding its leaves in dry weather, or very early in the autumn, makes it a tree to be planted cautiously near a house.

Fashion, of course, there is in planting as in everything else, and in this respect the fashion of dotting coniferous trees about lawns, whose real home is in a forest among companions, has often spoiled views from windows. They grow up exposed to every wind, unhappy and shapeless, or standing forlorn, unsuited to their surroundings. It is all very well to say that they are green throughout the year — the deciduous tree, it is true, is leafless in winter, but its form is always present, a form, in the case of many trees, as the lime and the birch, almost as attractive in summer as in winter. There are many other points in regard to planting in relation to houses which deserve a larger and more elaborate notice than it is possible to give them here. Such, for instance, is the question of planting in relation to aspect — a point which is frequently not sufficiently regarded. Planting may be done extensively and desirably for the purpose of breaking east and north winds, but it should, conversely, be done sparingly, and then with a full appreciation of the character of the trees and shrubs when plantations are made to the west and south of a house. Here again, imagination is most important. For some years a new plantation gladdens the heart of the owner every time he looks upon it from his window. Presently, he begins to notice that he finds less and less sunshine, the walks grow damp and green, and finally he comes to the conclusion that he has deliberately blocked out the sunshine. Nor is it possible to say anything upon the interesting question of what may be termed avenue planting, which is most important in relation to large mansions, and appears to be now rather neglected. This kind of planting must necessarily be often disconnected from the house, as in the magnificent vistas at Castle Howard, four of which converge on a center, after the French fashion; though at Blenheim, Vanbrugh's other house, the fine avenue comes right up to the southwest entrance.

Turning for a moment to shrubberies — which are within the reach of every one, from the owner of the villa in the suburbs to the possessor of an ancestral home — perhaps the most important point to bear in mind is that they should have variety of foliage and flower, so that both in summer and winter they should be a pleasant sight from a house, and, as it were, environ it at a reasonable distance with soft coloring. Mr. William Robinson, the well-known writer on horticulture, has rightly criticized the use of the common laurel, which has spoiled more shrubberies than any other plant, and for the use of which there is no excuse when the number of charming evergreen and deciduous shrubs which can now be obtained is remembered. But in the case of shrubberies, quite as much as in that of trees, their relation to the

house to which they are near should be borne in mind. Thus a slight convexity of line of the outer edge will give the appearance of space, and prevent house and shrubbery from seeming to crowd each other. So, too, care in placing low-growing shrubs in front places, and others, such as the fine cypressus, in the background, is more important, since it will frequently make all the difference to the appearance of the house to which the shrubberies belong.

The question of planting shrubs thickly or sparsely and their relation to the soil is chiefly one for the horticulturist, but it is a point which needs careful thought, and may make all the difference between an agreeable view from a drawing-room window, and one which is essentially disappointing. If placed too closely in the first place shrubs necessarily become too crowded, and then some of them must be sacrificed. Very often the shape of that which is left has been spoiled. On the other hand, when shrubs are planted sparsely, this necessitates more work in keeping the ground around them clean and free from strong-growing weeds. In many shrubberies also which are to be regarded as being in connection with houses, it is most important that flowering shrubs should be planted among the evergreens. It is the business of the horticulturist to recommend the shrubs best suited to particular soils and climates, and to advise how best to carry out the general principles which in many ways belong to the province of the architect, who too often sees views which he has thought over in connection with his work lost by thoughtless planting, rooms darkened by trees in too close proximity to a house, and agreeable approaches narrowed by the forgetfulness of the obvious fact that trees and shrubs increase in size from spring to spring.

SOME NOTES ON SOUTHERN ITALY.*

ASCOLI PICENO.

ASCOLI "Piceno" (for there is another Ascoli near Melfi) is situated in the valley of the Tronto, near the junction of the Castellano with that river, so that the walls rise from a picturesque ravine on both sides of the city, which is pleasantly situated in an amphitheater of hills, and bristles with many towers, which are more varied in form than those of the celebrated San Gemignano *"delle belle torri."* It is the ancient Asculum Picenum, and still retains many signs of its antiquity. It was the capital of the Picentines, and Pliny says that it existed before the transplanting of the Sabines. According to Florus it was one of the principal cities of the federation of anti-Roman Italy. In 299 B. C., however, Rome allied herself with Ascoli against the Etruscans, Samnites, and Senones, but the weaker party went to the wall and Ascoli was subdued by Rome. It rebelled, and took a prominent part in the Social War, giving the signal by killing the proconsul and other Romans. For this it was sacked by the Consul Strabo, and was afterward made a *municipium,* and from that time remained faithful to Rome. In medieval times it belonged to the Lombard League, but after a time became Ghibelline. It had a stormy and exciting history until the end of the sixteenth century. In 1185 it threw off its bishop's yoke and proclaimed itself a republic. Innocent III. excommunicated it in 1192, and two years after it returned to its allegiance, but welcomed the Emperor Henry VI. with festival. Then it rebelled against the imperial authority and was sacked in 1242 by Frederick II., so returned to allegiance to the most powerful and was allowed to build a fortress near the mouth of the Tronto, which was completed in three years, and so excited the jealousy of Fermo that long wars ensued between the cities with much damage. After that it struggled to maintain its liberty against Galeotto Malatesta, Francesco Sforza, and others. The latter stayed some time in the city and tried to stamp out suspected conspiracies by erecting quite a grove of gallows. In 1482 it bought the right to call itself a republic from Sixtus IV. at the price of an annual tribute of 3,000 scudi. The usual struggles between the principal families followed, and in 1535, during an *émeute,* the Palazzo Comunale with its archives was burned. In 1540 Paul III. sent a commissory and built the fortress of Porta Maggiore, but in 1555 the governor was killed and the Pope took away every privilege from the town and refortified the ancient Pelasgic citadel. It regained some of its privileges under Gregory XIII. in 1573, and, except for the excesses committed at the time of the French Revolution, has passed an uneventful existence since then.

The important antique remains include portions of the walls, the Porta Romana anciently called Binata, from its two equal arches standing side by side, through which the Via Salara passed, and the Ponte di Maestro Cecco, a Roman bridge also belonging to the Via Salara. Another bridge, with one fine arch bestriding the ravine, called the bridge of Solesta, is also recognized as Roman; a double gate was erected on it on the city side in 1230 to solemnize the peace between Fermo and Ascoli. There are three other bridges, one of which (the Ponte Maggiore), of three arches and 160 feet high, was built in 1373 by Massimo and Nicoluccio Ravvolto, Ascolan artificers. Near the Porta Maggiore is the fortress built by Galeoto Malatesta in 1349, remade by Antonio San Gallo and now a prison. The fortress built by Pius IV. on the ancient fort called the Cassero is now called "La Pia." There are also some small remains of a theater and an amphitheater, and on the hill above the town the church of the Annunciation, with its conventual buildings (now an agricultural college), occupies the site of the Ascolan baths, and a great palace of the prefect Polimius, the substructures of which are enormous masses of brickwork. The ancient aqueduct has been repaired, and supplies the town with good water. Other buildings occupy antique sites. The cathedral is said to have been built on the ruins of a temple of Hercules; the original substructures are still visible; and S. Gregorio Magno is said to be on the ruins of a temple of Vesta.

The Plazzo Anzianale, the ancient Communal palace, occupies the site of the ancient Palatium Album, the dwelling of the counts and governors, and contains a small museum in which are antique inscriptions, etc., many of which may also be seen incrusted in the walls of houses. It is at one side of the Piaza Aringo, near the Cathedral and Baptistry. The present façade dates from the seventeenth century, but last year the removal of some walls which cut up a portion of the interior into small rooms disclosed the ancient Loggia del Arringo in which the Council of eight hundred met to discuss public affairs. It is believed to have been built toward the end of the twelfth century, travertine being the material used, though some of the columns appear to have been of brick, plastered. The capitals are cubiform, slightly molded, as are the bases. There are fourteen columns with corresponding wall pilasters, which support a triple series of round arches about twenty-five feet high. The vaulting is quadripartite. The interior of the cathedral has been highly decorated in modern times. In a chapel on the right are several pictures by Crivelli of considerable merit (his pupil, Pietro Alamanni, also worked in Ascoli). The Annunciation by him now in the National Gallery was painted for the Ascolan church of SS. Annunziata to commemorate the concession of communal government by Sixtus IV. which arrived on Lady Day; after which the Annunciation became the official festival of the city. S. Emidius kneels beside the angel and bears Ascoli in his hands.

The town was the outpost of the Pontifical States toward the kingdom of Naples, and has a good deal of fourteenth-century Gothic and early Renaissance architecture in it, as befits a place which was of importance in those times. The church of SS. Vincenzo and Anastasia bears a date, 1389, on a stone by the south door. The side doors are both of this period, but the west door appears to be earlier. There is a clerestory of small two-light windows, four on each side, which have the Byzantine block above the capital and small round arches, and the Campanile, which is contained in the rectangular plan, has similar coupled arches with widely sloping caps. Round arches without moldings are within, resting on square piers with small imposts; the eastern end is apsidal. Another curious church is S. Giacomo, square in plan and without external apse, though the masonry of the east wall shows a large pointed arch. It has a small wheel window in this wall with twisted colonettes radiating to round arches without moldings. The west door has a damaged fresco above it in the lunette, and resembles that of SS. Vincenzo and Anastasia in design, with two twisted columns in the angles and a dogtooth among the arch moldings. The design of the scroll of the archivolt is very twelfth century. The side doors had pent-house roofs and are simpler; all are of the fourteenth century. The Campanile here is also contained in the plan, and has round arched openings and a conical top above the cornice.

The great church of S. Francesco at the end of the Piazza del Popolo, built in 1269 by Antonio Vipera, has its façade on the "Trivio." The central door has a fresco in the lunette over the door and foolish lions mounted on pillars at the sides. Ranges of elaborately twisted and chevroned pillars are in the jambs, and the arch is flanked by pinnacles, with four rows of sunken empty panels of curiously varied shapes at the top. Those of the side doors have three rows only. The carving of ornament is rich and rather Byzantine in treatment, using the drill a good deal and sharply cut. At the top of each side-band of ornament is a bull's head. The door on the south is somewhat similar, but is surmounted by a Renaissance addition, with very tolerable effect; close to it is the charming Loggia de' Mercanti, a very pretty Renaissance arcade. The interior is very fine and simple in proportion, spacious and quite undecorated. An arcade of five lofty pointed arches serves the nave, then comes a transept, in which the aisle wall is pierced with a double arched triforium and arcade below. There is an octagonal dome with four large and four small sides, with a blind arcade of pointed arches within and small pendentives below. The apse is six-sided and vaulted, and in three of the sides are simple windows. The vaulting of both nave and aisles is quadripartite, that of the nave on a higher level, springing from pilaster strips. The lower stories of the two towers which flank the apse open into the church by similar arches to those in the end of the transepts. The window tracery of the side walls much resembles the quaint shapes of SS. Annunziata, Solmona. Externally the effect is fine and masculine, with broad surfaces and few moldings. The Piazza del Popolo is surrounded by a fourteenth-century arcade, reminding one of Verona or Padua. There is but one story above it and then Ghibelline battlements of brick, shown above the Loggia de' Mercanti in the drawing. In the middle of one side is the Palazzo del Comune, restored after the burning in 1535, but still retaining the earlier tower. The Baptistry is very early, probably of the ninth century. The ground plan is a square and at the angle are pendentives making the upper part octagonal, with an arcade of three arches on each side, except at the west where there are four, beneath a small roof cornice. Beneath each group in the con-

* Paper by "F. H. J." in *The Builder.*

tinuation of the square wall is a small window with imposts. Below that on the west side a discharging arch shows. There are doors on the east and south sides and a few antique fragments are built into the walls. The roof, of flat slope, is crowned by a little pinnacle pierced with pointed arches. The door on the east is square-headed, has simple moldings, and is flanked by square-headed panels; above all three features are triangular sinkings. The south door has a round arch with lintel below formed of a fragment of Comacine interwoven pattern; on the left jamb is a kind of cap, on the other rough volutes. The architrave molding is rather flat, but much more elaborate than in the other door.

Another interesting ancient building is the Casa Longobarda, which appears to be really of the eighth or ninth century, and retains much of its original appearance. On the upper story there are four double arched windows with central colonettes, the caps to which are queerly shaped and roughly cut, and one has a carved base. One of these windows was ornamented with "scodelle" on the jambs and on the walls near to it. The door is at present round-arched without moldings, above it is a square-headed window, and there is one to the left of the door with sickle shapes and letters carved on the lintel in low relief. The upper windows have a cable molding and fillet round the arches, and the spandrils of three of them have carvings very slightly modeled, with the ground sunk round the outline. The first has a castle and two anchors, the second two trees, quite modern in their simplicity and lack of design, the third animals and a hunter chasing them. Above runs a twisted band into which the gargoyles sink. On the side toward the street are also sinkings for "scodelle" and fragments of an interwoven band now displaced. The roof is a lean-to against one of the towers of the medieval Ascolan nobility, of which there were once two hundred, with a small square window at the top and ornaments grouped about a round sunk panel. Above the tower door a triangular sunk panel occurs, with a slit across it cut through the wall for light. There are many Renaissance houses, both early and late, with delightful picture-frame-like windows carved with arabesques, balconies and loggias.

Cola del Amatrice, painter and architect, was born in the Ascolan territory, and there is a painting by him in S. Francesco, but its most distinguished citizen was Pope Nicholas IV. His name was Girolamo di Massio and he was of noble family. He lived long at S. Francesco as a monk and became general of the Franciscans some time before his election to the papacy in 1288. He presented many things to the churches and monasteries of Ascoli, and accepted the office of Podestà. The cope which he sent to the cathedral was stolen in 1902, lately rediscovered in the collection of Mr. Pierpont Morgan, but S. Francesco still has a cross sent by him preserved in a reliquary made in the fifteenth century. The cross is of gilded copper with arabesques in filagree, and the reliquary is of silver gilt with sharply pointed dormers and twisted colonettes on a copper gilt foot, ornamented with translucent enamels of violet color. It is the work of the Ascolan Pietro Vanni, whose productions may also be seen at Osimo, Bovino, Amatrice and Castignano, according to M. E. Bertaux. The treasury of the cathedral contains an altar frontal of silver of the second half of the fourteenth century, with a number of New Testament subjects in relief in oblong panels, perhaps the work of a local artist; an Italian fourteenth-century coffret in ivory, octagonal in plan, and carved with the history of Paris; a reliquary of the arm of S. Emidius, and a silver statue of him of the end of the fifteenth century. S. Emidius was Germain of Trèves, the first bishop of Ascoli, and is still the patron saint. The reliquary of the arm is also attributed to Pietro Vanni; it is borne on a high base hexagonally starlike in plan, of silver partly gilt and enameled. Half-length figures are engraved in medallions on the foot. The statue is by the same hand, cast by the *cire perdue* process, and delicately chased afterward. The border of the cope has subjects engraved on it. There is also a silver statue of the Virgin of the second half of the sixteenth century, ascribed traditionally to the Florentine Curzio Compagni, a sixteenth-century Crozier, designed by Vasari, and an altar frontal embroidered in silk, with figures of saints, also of the sixteenth century. At S. Pietro Martire is a fifteenth-century reliquary which was made for a beautiful little angel of French twelfth-century workmanship. Eighteenth-century work is not referred to here, but those who like it will find plenty in Ascoli.

THE DRAINAGE OF A HOUSE.*

SO long as cast-iron pipes can be kept free from corrosion they may be regarded as being satisfactory for drainage purposes. Corrosion, however, soon sets in, with the result that the velocity of flow of the sewage matter in the pipes is seriously impeded, and the efficiency of the drain is lost. To counteract corrosion several expedients have been adopted, of which the best known is Dr. Angus Smith's solution; then there is the Bower-Barff process of forming a magnetic oxid of iron on the surface of the pipe; and lastly, by lining the pipe with what is termed *glass enamel*.

A short time ago the writer got the various preservatives on cast-iron pipes tested with a weak solution of sulphuric acid, and the following are the results:

The first experiment was made on a glass-enameled pipe, and, on being immersed in a one per cent solution of acid, the enamel was immediately affected, and at the end of twenty-four hours the enameled skin resembled a piece of damp blotting paper.

The next experiment was made on a pipe treated by the Bower-Barff process, but this time a weaker solution was used, one part acid to two hundred parts water, and the result was that all the oxid was removed. The acid acted upon the pipe whenever it came in contact with it.

The last experiment was made on a pipe coated with Dr. Smith's solution. This pipe was also immersed in a one-half per cent solution, and at the end of twenty-four hours the skin was all peeling off.

It may be argued that a system of house drainage is not required to stand the action of acids, and that the above tests are no guide as to the suitability of cast-iron pipes coated with one of the preparations mentioned for the carrying away of soil and waste from our dwelling-houses. The writer, however, holds the opinion that a drain should be able to stand the action of any liquid which may be poured into it. No objection on this point can be made against fireclay pipes, if first quality pipes be used. At the same time as the experiments were made on the cast-iron pipes, a fireclay pipe was immersed in a five per cent solution of acid, and the acid had no effect on either body of pipe or glaze.

An advantage of cast-iron over fireclay piping which is brought forward is the ability of cast-iron piping to stand hydraulic pressure; but is this required? The following tests to find the pressure that a drain pipe requires to stand, and the strength of a fireclay pipe, were made for the purposes of this paper:

A wash-down closet was tested with a pneumatic pump and the pressure found necessary to break a water seal of 2 inches deep was .120 pound per square inch, while to break a seal of 3 inches deep required a pressure of .145 pound per square inch. A 4-inch diameter fireclay pipe was tested up to a pressure of 45 pounds per square inch, but showed no signs of porosity at the faucet. This test showed that a fireclay pipe will stand a heavy internal air pressure before bursting, but to find the exact pressure that a pipe would stand and still be air-tight, another pipe of the same size was taken and tested. The pressure was gradually increased at intervals of ten minutes, from .5 pound till a pressure of 3.3 pounds was reached, and the mercury in the manometer remained steady at that pressure for twenty-four hours. From this we may judge that this pipe was capable of standing a pressure of 3 pounds per square inch, or fully twenty times the pressure required to break a 3-inch seal of a wash-down closet. This is a sufficient margin for all practical purposes.

To test the efficiency of embedding a fireclay pipe in concrete, a second quality pipe was put under a pressure of 5 pounds per square inch, but it was so porous that the mercury in the manometer fell 3.5 inches in twenty minutes. The pipe was then encased in 6 inches of concrete, and, at the end of three days, the test was again applied with the following result. The pressure was applied gradually at intervals of half an hour, commencing with .5 pound of pressure. There was no sign of leakage up to 3 pounds of pressure, but when 4 pounds per square inch of pressure was applied, the mercury fell .1 of an inch during half an hour. From this it will be seen that a 6-inch layer of concrete around a pipe makes the pipe sufficiently air-tight.

A further test of the strength of fireclay pipes was made, this time by hydraulic pressure. They were tested up to a pressure of 250 pounds per square inch without showing signs of fracture, but showed signs of porosity in one pipe at 60 pounds of pressure, and in another at 100 pounds.

Another argument against the use of fireclay pipes is, their liability to fracture through any unequal settlement of the ground on which they are laid or of the building they pass through. The liability to fracture through unequal settlement of the ground on which they are laid may be overcome by the laying of a bed or layer of concrete underneath the pipes, and if the ground is very soft or unequal, the writer would suggest that by the use of ferro-concrete it may be overcome. If sufficient size of openings is formed or left in the walls, and these openings are properly linteled over with a space between the lintel and the pipe, there is no fear of any damage being done to the piping through any settlement that may take place in the building.

Another point of importance in connection with the laying of fireclay pipes is the nature of the joint and the material to be used for making the joint. By the introduction of faucets, such as the Hutcheson or the Fitzpatrick faucets, a more satisfactory joint can be made than is possible with the ordinary spigot and faucet pipes, even although rope-yarn is used. The writer recommends that nothing but a slow-setting cement, thoroughly cooled and aërated, be used, and that it will be well staved into the joints so that all the air in the cement be forced out, and a thoroughly air and water tight joint will be the result.

We are all familiar with the objections to cast iron being used for the trunks of closets and for sinks. The same objections can be applied even more forcibly against the use of cast-iron pipes that are to be buried underneath the ground, when fireclay pipes, as has been shown, can be got which will make a tight enough job and be more satisfactory, as there is no fear of corrosion, and you can empty any kind of liquids into them with no fear as to the result.

While efficiency is the point to be looked at in planning a drainage scheme and selecting the materials for the same, the question of cost has also to be taken into consideration. On looking into the comparative costs of fireclay pipes laid in the manner here suggested, including costs of concrete, and of cast-iron

* Part of an abstract of a paper by Mr. Samuel Smith, read at the recent Glasgow Congress of the Sanitary Institute.

piping coated with Dr. Smith's solution, the writer finds that the cost of cast iron, or straight piping, exceeds that of fireclay by from fifteen to twenty per cent. The increase in the cost of bends and branches is fifty to sixty per cent, while on traps it is three hundred per cent. It will thus be seen that, for a drain laid with fireclay piping, the advantages of being more efficient and economical can be claimed.

The writer would suggest that fireclay pipemakers test their pipes to say sixty pounds of hydraulic pressure, and sell their pipes with a guarantee that they will stand that test. If this were done the users of pipes, in the knowledge that they were getting a satisfactory article, would readily pay an additional ten per cent on the cost of them, and the result would be more satisfactory to all parties concerned. Improvements have been made in recent years on fireclay pipes, and further improvements could and would be made if makers saw that it was to their advantage to do so, through there being a demand for a superior article.

THE CONSTRUCTION OF HOSPITALS.

A PAPER on "The Construction of Hospitals" was read before the Sanitary Institute Congress, which met at Glasgow the first week in August, by Mr. Alexander Cullen, F.R.I.B.A. After stating that he proposed to deal particularly with hospitals for the reception and treatment of cases of infectious disease, yet his remarks would, in a number of details, apply to hospitals of all kinds. The author said:

"Suppose, then, the sanitary authorities of a town of about one hundred thousand of a population have, after considerable pressure by the local government board, resolved on the erection of a hospital for the treatment of cases of an infectious nature. The next question that comes to be considered is the number of beds for which provision should be made. It is customary to provide one bed for every thousand inhabitants within the area that the particular hospital has to serve. While this may be sufficient under ordinary circumstances, it is always well to provide accommodation on an ample scale. In order, therefore, to meet emergencies in times of exceptional epidemics, which are observed to occur at intervals of three, four, or five years, accommodation should be provided to the extent of three beds for every two thousand of the population. In this particular case we shall assume that the hospital is to be planned on the higher standard and to accommodate one hundred and fifty patients.

"In the site of a modern hospital for infectious diseases an area of one acre for every twenty beds is considered sufficient, but in the present instance we are dealing with a model town council, and they have the wisdom to foresee the possibilities of a future extension of the buildings, and decide on acquiring ten acres of land. This question of site is a very important one, and it is well that the medical officer should be consulted on the matter, who in all likelihood will direct his attention to its physical conditions, such as aspect, prospect, and inquire into the nature and extent of the sickness and the rate of mortality in the particular district. After satisfying himself on these points, the medical officer recommends a site. It is situated in the open country, yet convenient to the district the hospital has to serve, so that patients have to be driven only a short distance. The ground slopes gently toward the south, and it is well sheltered by trees, both on the north and on the east sides. The soil is of a dry loamy nature, and is well under drained. The water level in the subsoil is fairly deep and permanent and there are no objectionable conditions near that might lead to the pollution of the soil. There is an abundant supply of water for the needs of the hospital, and a good drainage outlet can be obtained. The cost of the land will depend to a considerable extent on the situation, but supposing there are exceptional circumstances to be taken into account a fair value would be from £250 to £350 per acre.

"The site having been fixed on, the next matter that comes under consideration is the nature and number of the diseases to be treated. On this question the medical officer will be guided by the statistics of the infectious diseases prevalent in the district more especially during epidemics. His experience also in the practical working of a hospital will indicate the extent of the administrative offices necessary for the effective management.

"Suppose, then, the following program of classification with explanatory notes has been prepared: Scarlet fever, 100 beds; enteric fever, 20 beds; diphtheria, 12 beds; measles, 10 beds; typhus fever, 8 beds. Total, 150 beds.

"The accommodation for cases of scarlet fever to consist of two observation or probationary wards of two beds each. In these wards will be received cases considered to be scarlet fever, but in which the diagnosis was doubtful. Here such cases will be detained until the nature of the illness has declared itself. The ordinary pavilions to provide 72 beds divided into wards of 12 beds for females and young children and wards of 6 beds for male adults. Attached to each ward there is to be a one-bed ward intended for special cases or for private patients.

"*Isolation Block.*— Of two wards of four beds each for the isolation of cases of double infection, such as scarlet fever with diphtheria, scarlet fever with whooping cough, or scarlet fever with measles.

"*Discharge Block.*— Divided into two wards of four beds each. To this block would be sent the patients believed to be free from infection. Here they would receive special bathing, and be under careful observation for a few days prior to their discharge. These precautions are intended to avoid 'return cases'— that is, cases which occasionally occur in the households to which patients have returned from the hospital.

"*Enteric Fever.*—The accommodation for enteric fever patients to consist of two wards, one for twelve beds, the other for six beds, and attached to each a one-bed separation ward.

"*Diphtheria.*— A block consisting of a general ward for eight beds, and four single-bed wards, besides a small room, well lighted from the roof, where operations may be conducted. In the one-bed wards are to be special steam connections to provide a moist atmosphere for critical cases.

"*Measles.*— A block having a six and a four bed ward intended for the isolation of cases occurring under circumstances involving special risk of the spread of the disease.

"*Typhus Fever.*— A block divided into two wards of four beds each. Although cases of typhus fever are not of frequent occurrence, still it is better to provide for an emergency. This block when not in use for its special purpose would be available as convalescent wards for enteric fever patients when that disease is prevalent.

"*Administrative Block.*— This building should be located about the center of the group, and convenient to the entrance gate, so that any one calling on business, or vans delivering stores, would not go near the wards where patients are being treated. Accommodation should be provided sufficient to cope with any emergency that may arise, and the possibility of a future extension should be kept in view. In a hospital for one hundred and fifty patients there will likely be a staff consisting of a medical superintendent and an assistant, a matron, thirty-nine nurses, fifteen female servants, such as ward maids, laundry maids, kitchen servants and house maids; besides four male attendants. The ground floor on one side of the block should be devoted to the medical officer, and the other side to the matron and nurses. On the first floor should be the sleeping accommodation for the matron and nurses, each nurse to have a separate room about 12 feet by 9 feet. Ample bathrooms and lavatories should also be provided. Special precautions to be taken to have the rooms for the night nurses in an undisturbed wing of the building. The female servants to have their sleeping apartments on the second floor, but entered by a separate stair from that to the nurses' quarters. In the rear would be the kitchen department. The kitchen should be a large apartment, well lighted from the roof and thoroughly ventilated. Attached to the kitchen are to be a wash-up scullery, a vegetable scullery, and a service-room with a recess for food trolleys; besides the necessary stores and larders. The milk store should have an intervening lobby for scalding milk pans.

"*Laundry.*—The laundry should be removed as far as possible from the infected buildings with which it should have no connection by covered ways. This block may with advantage be divided into two sections, one for male and the other for female labor. In the first section will be placed, perhaps in the basement, the steam boilers, coal store, fire pumps, engine-room, workshop, destructor for destroying the hospital garbage, and a steam disinfector sufficiently large to receive bedding or other large articles. In the second section would be the wash-house and ironing-room. The ironing may be common to the clothes of the staff and the patients, but there should be separate wash-houses for the soiled linen of the staff. The receiving and discharge rooms should also be separate. The drying chamber would be convenient if placed between the wash-house and ironing-room, the hot air being driven into this chamber by a fan; and a fan will also be required for extracting the steam from the wash-house. As a laundry is the place in a hospital where infected articles are gathered, special precautions should be taken. The soiled articles from the wards should be placed in steeping tanks, and the tanks classified for the different diseases.

"*Entrance Lodge.*— This building to be placed near the entrance gate where the head male servant would reside, and his wife act as gatekeeper. Attached to the gate lodge there is to be a waiting-room for friends of patients. The accommodation for the male servants to be on the upper floor of the lodge, but entered by a separate entrance. Between the entrance gate and the wards there should be a waiting-room for ambulance nurses, and fitted up with a hot plate and shelves for blankets.

"*Mortuary.*— This building to consist of a mortuary and post-mortem room, a small laboratory, and a room for friends to view the body; the body, instead of being placed on a slab in the usual manner, will be laid on a bed, and the bed can be wheeled into the viewing-room.

"In the compiling of the program I assume that the medical officer has been associated with the architect, and the architect will be wise if he continues this association until the general principles of the scheme are fully matured; after which the medical officer will be wise to leave the carrying out of the details to the practical architect. The architect in preparing the plans keeps closely to the program of classification, and connected therewith. The first point to receive this attention is the ward; for the form of a ward governs to a considerable extent the planning of a hospital. It may be taken as an axiom that where land space permits, the wards are better if contained only on one floor; the pavilions are, therefore, planned one story in height. The distribution of the several buildings on the site is a matter of the utmost importance, in order that each ward may obtain the fullest amount of sunshine. The longitudinal axes of the several blocks are, therefore, placed north and south on the site, or, perhaps, a few degrees east of south and west of north. By this arrange-

ment sunshine on three sides of the wards can be obtained. The plans are based on this principle, with the result that the wards are arranged on parallel lines, as shown on the block plan to which I wish to direct your attention. The space between the pavilions is forty feet, and there is a zone of fifty feet between the buildings occupied by infected persons or things and the hospital boundary. The communication between the several parts of the hospital is direct, and for the comfort of the staff the paths are roofed over but open at the sides.

"The floor area and cubic space of a ward have to be regulated to a considerable extent by a standard set up by the local government board. The area is given at 144 square feet, and the cubic space at two thousand feet per patient. These units, however, need not be strictly applied in every case. For instance, is it not reasonable to suppose that the cubic space in an acute ward should be more than in a convalescent ward? Besides, medical authorities recommend that in cases of enteric fever and diphtheria the standards should be increased. The width of a ward will regulate the other dimensions, but it should be noted that floor area is of more value than additional height of ceiling. An ample width should be allowed for tables and fire stoves in the center of the ward, and also to permit of the bed being kept about one foot from the wall.

"Taking all these points into consideration, it seems that twenty-six feet is a suitable width and thirteen feet a convenient height for a ward. The width and the height having been fixed, the only question that now remains is the distance between the beds, and this distance will determine the cubic capacity of the ward. In the plans under consideration there is provided twelve feet of wall space per bed for the scarlet fever convalescent wards, while in the scarlet fever acute wards and in the wards for diphtheria and enteric fever the distance is thirteen feet. The cubic space in the one instance is 2,028 feet, and in the other 2,197 feet.

"The window space in a ward will be governed by the floor area and cubic contents. Experience has shown that in this country one square foot of glass is required for every sixty cubic feet of space, but where verandas overhang windows, or where wards are lighted only from one side, the glass area should be increased.

"The bathroom is at the entrance end of the ward and is provided with two baths, one of the usual size of six feet and a smaller one for children. The baths will be rapidly filled and emptied. The sanitary appliances are placed in a turret at one of the distant angles of the ward, and are separated therefrom by a well-lighted and ventilated lobby. Here will be two water-closets and a sinkroom. In this room will be fitted up a combined arrangement of sinks divided into three sections: the first consisting of a grooved slope about 3 feet 6 inches long for the cleansing of macintosh sheets, the second of a scalding sink for washing urine bottles, and the third a sink for flushing bed-pans, and which will serve also as a slop sink. In the sinkroom there is also a small cupboard for the retention of bed-pans that have to be examined by the doctor. At the other angle of the ward, facing the southeast, is a sunroom, which is divided from the ward by folding doors, so that patients unable to leave their beds can be wheeled into the room. Between the two angle turrets is a veranda for the use of patients who are able to move about. The one-bed ward is near the entrance, and has its own sanitary conveniences.

"The ward kitchen is placed between the two wards, and has an inspection window into each. In this room will be a small fire range or steam closet for keeping food warm; besides a wash-up sink and a dresser. Near the ward kitchen is a nurses' toilet-room and water-closet, a linen store and a milk larder.

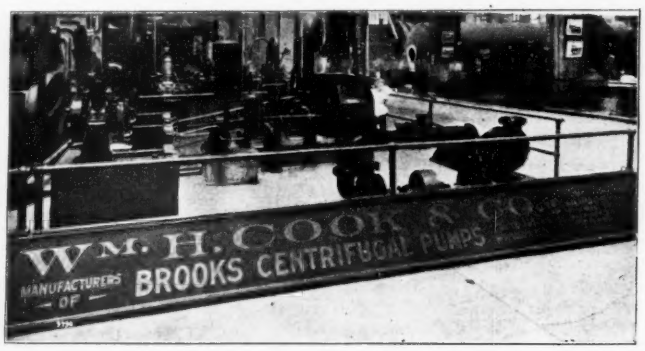
"Having given a general description of the plans, let me now direct your attention to the construction, finish and equipment of the hospital. The essential requirements are ample light and ventilation, no sharp angles of moldings to catch dust, the wall surface and floors of a hard, non-absorbent nature, also as little woodwork as possible; the whole so planned and constructed as to require a minimum of care or repairs. The method of construction and finish of the plans now shown is intended to accomplish this result.

"The foundations will be of Portland cement concrete, and the damp-proof course of Caithness pavement two inches thick. The area under all floors will be covered with a layer of asphalt. The walls will be built of brick 16 inches thick, consisting of a 9-inch outer face, a 2½-inch hollow space, and a 4½-inch inner facing tied together with galvanized iron straps. The ward floors will be of teakwood, and the surface shellacked and wax polished. The skirting will be of the same materials as the floor, and hollowed or coved to a 3-inch radius. The corridors and sanitary turrets will be paved with marble terazzo, while the bathrooms will be paved with india-rubber interlocking tiles. The windows in the wards will have the lower part hung as an ordinary window and the top hinged to open inward. There will be no other projections to harbor dust, and all the facings will be rounded and keyed to the plaster. The glazing will be of polished plate glass, as this is preferable to double glazing with sheet glass, for in course of time the space gets filled with dust. The doors will have flush panels and the plainest of furniture. The standards on which the doors are hung will be checked for the doors and the wall plaster, so that no cheeks or facings will be required. The plumbing will be executed on the most approved principle. The pipes and fittings will be exposed, and all traps will be ventilated to the roof. The walls of bathrooms, sanitary turrets and corridors will be lined to a height of five feet with white enameled tiles. The buildings will be lighted by electricity, and there will be telephonic communication through the several blocks.

"*Heating and Ventilation.*— The boilers for raising steam will be placed in the laundry block, the steam being conveyed in subways to a central point in each block. The steam will be led into calorifiers, of which there will be two — one for the supply of hot water to baths and sinks, and the other for the heating system. Between the beds will be hot-water radiators with high legs and baffle plates on front and fitted with a ventilating register, through which the fresh air will be introduced. The radiator will be fitted with valves so that the temperature in each ward can be regulated. The heating power should be sufficient to maintain a uniform temperature of 62° in the wards.

A WORLD'S FAIR EXHIBIT AT ST. LOUIS.

THE accompanying illustration will give an idea in a rather inadequate way of the very interesting exhibit in the Machinery building, group 62, block 32; aisles E and 5, of the various pumps manufactured by William H. Cook & Co.,



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OUR ILLUSTRATIONS.

Residence, San Francisco.

Residence, Toledo, Ohio. Bernard Becker.

Seminary, Milwaukee, Wisconsin. Ferry & Clas, architects.

Special Plate: Festival Hall and surroundings, Louisiana Purchase Exposition. Cass Gilbert, architect.

The Ryerson building, Chicago, published last month, is located at Adams street and the river. It is of the most modern fireproof construction, and brick exterior walls. Its proximity to the river called for considerable ingenuity in the foundation construction, and to protect the adjoining party wall. It is the successful carrying out of difficult engineering feats that has done much to give the general contractors on this building, the Wells Brothers Company, Chicago, their high standing. Their large facilities and efficient staff enable them to complete their contracts within the time specified.

Buildings of Louisiana Purchase Exposition, St. Louis, 1904.— Imperial German Government building, Restaurant pavilion and wing of Colonnade of States, E. L. Masquery, architect; Town Hall of the Model City, A. Kelsey, architect; the Civic Pride monument in the foreground, Massey Rhind, sculptor; Nursery, German Section Varied Industries building; interior of School of Arts and Crafts, Prague; Kansas City Casino, on Model street, Van Brunt & Howe, architects. Signing of Louisiana Purchase Treaty at Paris, Karl Bitter, sculptor. Entrance Mines and Metallurgy building, Theodore C. Link, architect. Palace of Electricity, Walker & Kimball, architects. Palace of Manufactures, Carrere & Hastings, architects. Palace of Liberal Arts, Barnett, Haynes & Barnett, architects.

SPECIAL PLATES.

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Festival Hall. Cass Gilbert, architect.

Palace of Electricity. Walker & Kimball, architects.

Skyline Effect, Palaces of Machinery and Electricity.

Palace of Machinery. Widman, Walsh & Boiselieur, architects.

Grand Basin from the Cascades, Louisiana Purchase Exposition.

Music and Art Sculpture Group, Louisiana Purchase Exposition, by Hermon McNeil.

Palace of Mines and Metallurgy, Louisiana Purchase Exposition. Theodore C. Link, architect.

Palace of Education and Social Economy, Louisiana Purchase Exposition. Eames & Young, architects.

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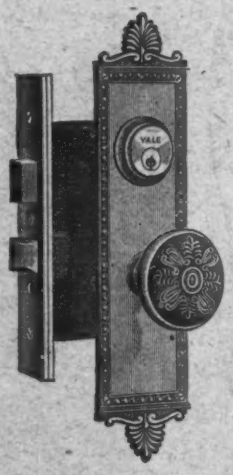

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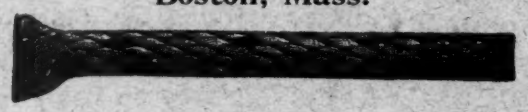

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